ANALYSIS OF DEBT MARKET INDICATOR BEHAVIOUR

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Abstract

This paper analyze the debt market, focusing on the behavior of soverign yield and Credit Default Swap (CDS). We build several empirical models to test the factors determine these two indicators and apply them using the Indonesian and peers data. The result confirm the significance impact of foreign reserves and VIX index on the bond yield in Indonesia and its peers country. On the composite sovereign bond, the result shows that the real effective exchange rate (REER) and the debt service ratio (DSR) significantly affect the yield, while on the corporate bond yield, the significant explanatory variables are return on equity (ROE), inflation, the current ratio (CR) and net profit margin (NPM). However, there is an anomaly where the impact of the last two variables (CR and NPM) are contrary to the theory.

Keyword: Sovereign, bond, yield, debt market, risk, corporate fundamentals.
JEL Classification: H63, G31

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I. INTRODUCTION

Developments in global financial markets are very fast, becoming more integrated and simply impossible be stopped. All the changes occurred are quickly responded by the financial market indicators. The development of financial markets is becoming more rapid and more integrated in causing positive and negative impacts for the development of domestic financial markets. The easily transmitted crisis effect is one of its negative impacts. Various issues in many parts of the world, even those that are not directly related to the condition of a country or a corporation, are responded quickly by the movement of financial market indicators, especially the debt market. Thus, how important is it for Bank Indonesia to keep observing at the development of financial market indicators, especially the debt market?

The debt market indicators reflect market appreciation against the risk of foreign loans, particularly in the form of global bond issuance in both primary and secondary market. This directly affects the movement of supply and demand of foreign exchange arising from foreign loans and portfolio investment.

By embracing the free floating exchange rate regime (and inflation as the target end), it is possible to achieve the independence in monetary policy and the integration of financial markets, and thus Bank Indonesia is believed to be uncapable simultaneously achieving the

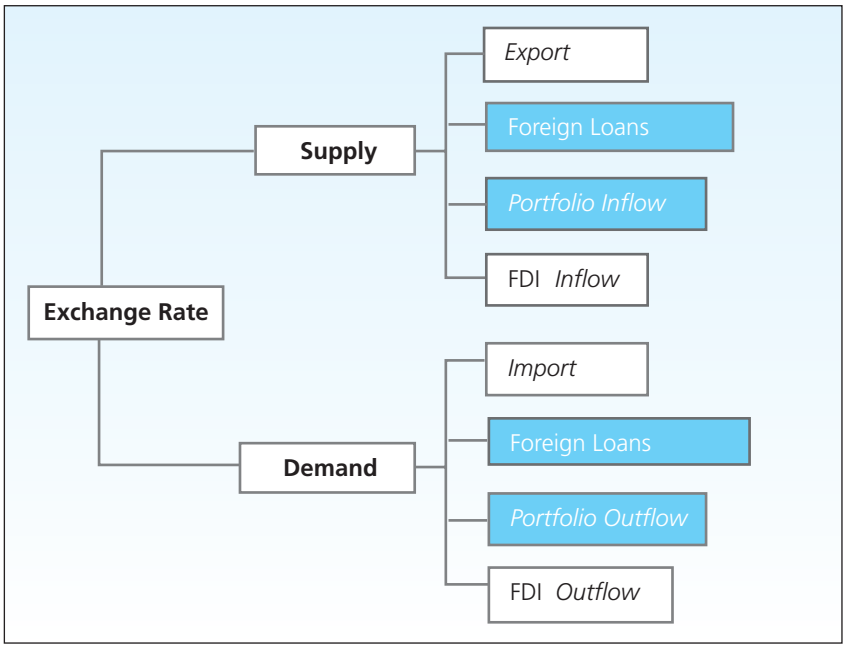
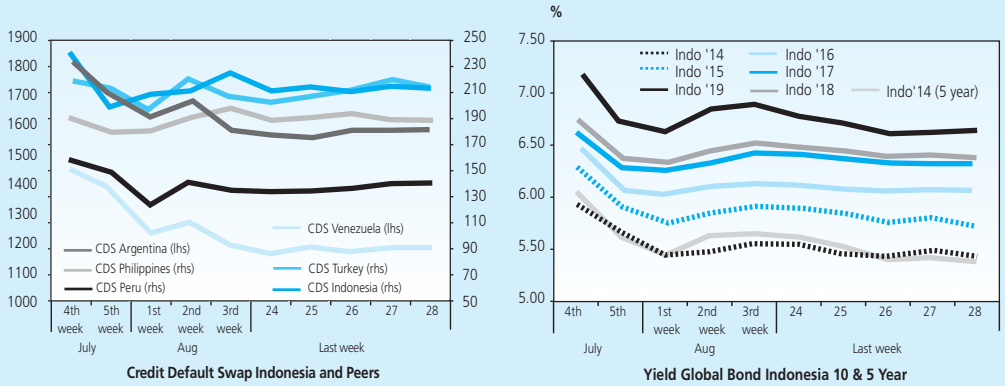


Diagram 1.
Structure of Foreign Exchange Supply and Demand

exchange rate stability, known as the Impossible Trinity Theory. The exchange rate will fluctuate, determined by the supply demand forces of the forex market. However, foreign exchange supply and demand should be managed so that the exchange rate moves in accordance with economic fundamentals and not fluctuate too much. Excessive exchange rate fluctuations will disrupt the macroeconomic stability and the sustainable economic growth in the long term. Meanwhile, the foreign exchange supply and demand structure basically consist of 4 stream, namely: (1) Export-Import, (2) Foreign Loan, (3) Portfolio Investment, and (4) Foreign Direct Investment (FDI). Therefore, it is important for Bank Indonesia to examine and investigate the movement (behavior) of various indicators of debt markets, particularly the factors that fundamentally affect the debt indicators of market movements.

The debt market indicators that are widely used global are the yield bond and also recently are CDS. For example, on 26 February 2009, the Indonesian government made an initial Global Medium Term Notes (GMTN) worth a total of USD 3 billion with a rating of Ba3 (Moody's) / BB-(S & P) and BB (Fitch), which consists of 2 tranches. Tranche 1 of USD 1 billion, 5-year tenured, published with a coupon 10.375%, yield 10.5% (8.474% above UST with the same tenor) and at position of discounted price at 99.455% while Tranche 2 USD worth 2 billion, 10-year tenor, coupon 11 625%, yield 11.75% (8.759% above UST with the same tenor) and 99.276% price. These notes are the biggest debt securities in Asia and the biggest debt ever offered by the Indonesian government.

When compared to the issuance of securities of peering countries (which have rating similar to Indonesia), like Philippine government in January 2009, Turkey in September 2008



Source : Bloomberg 2009

Figure 1.
Government Bond within 10 years and CDS Indonesia and *Peers*

and Brazil in early 2009, the coupon and the yield issuance GMTN Indonesian government is expensive. But a high price can not be avoided because at the time of publication GMTN, global yield bond Indo'18 (10 years) is in the range of 10% to 11% and the CDS of Indonesia is in the range 640 sd. 661 bps. The increase global yield bond Indo'18 (10 years) and CDS occurs significantly in the early months before the publication of GMTN and peaked at the time of pricing. The improvement of global bond yield indicator and CDS from time to time, significantly affects the cost of funds of the global publishing of Indonesia, and thus also expected vice versa.

Table 1.
Global Bond Yield of Indonesian Government

Year	Issuance date	Yield at Issuance	2003	2004	2005	2006	2007	2008
INDO'17 (coupon = 7.5%)	3-Feb-06	7.00%	-	-	-	6.78	6.22	7.92
INDO'14 (coupon = 6.75%)	March 3, 2004	6.85%	-	7.50	6.85	6.62	6.08	7.46
INDO'15 (coupon = 7.25%)	April 13, 2005	7.38%	-	-	7.27	6.69	6.15	7.70
INDO'16 (coupon = 7.5%)	October 5, 2005	7.63%	-	-	7.33	6.76	6.21	7.80
INDO'35 (coupon = 8.5%)	October 5, 2005	8.63%	-	-	8.23	7.36	6.89	8.58
INDO'37 (coupon = 6.75%)	7-Feb-07	6.75%	-	-	-	-	6.89	8.44
INDO'38 (coupon = 6.75%)	January 17, 2008	7.75%	-	-	-	-	-	8.63
INDO'18 (coupon = 6.875%)	January 17, 2008	6.95%	-	-	-	-	-	7.96
INDO'140504 (coupon = 10.3750%)	4-Mar-09	10.50%	-	-	-	-	-	-
INDO'190304 (coupon=11.625%)	4-Mar-09	11.75%	-	-	-	-	-	-

Source: Bloomberg 2009

Furthermore, on 16 April 2009, the Indonesian government has set an offering price SBSN (Surat Berharga Syariah Negara/State Islamic Securities) or sukuk at USD 650 million. Those sukuk are sold at a nominal 100% with a fixed return rate of 8.8% per year, a tenor of 5 years of the date of publication 23 April 2009. The issuance of Sukuk of these foreign exchanges a prime issue for the Government in the international market as well as the largest sukuk straight issuance straight in the denomination of USD outside the GCC countries and is the first benchmark of USD-denominated sukuk in Asia since 2007. State Sukuk price is relatively lower when compared with the previous publication, not only due to a more secured structure of the transaction, but also not the reference condition of the global yield bond and CDS Indonesia, which tend to decrease.

Several research on indicators of debt market have been conducted, including the examination of the relationship between coorporate CDS and bond yield (Houweling et al 2001)[2] and Hull et al (2003), the differences in corporate CDS and yield that arise only in the

2 Howeling, P. and T. Vorst (2001) ''An Empirical Comparison of Default Swap Pricing Models", mimeo, Rabobank, December 2001

short term but will achieve its long-term equilibrium price (Zhu 2006). Another study is applying the application the Vector Error Correction Model (VECM) which found out that sovereign CDS and sovereign bond market have a very significant price difference. But the study that examines the CDS as an indicator of sovereign risk (Cossin and Jung 2005) is very rare.

In addition the individual yield spread, there is also the yield composite which is an indicator that the market read as an debt market performance indication of a particular country or region. Yield spread composites such as the EMBI, EMBI Global, EMBI + and CEMBIC describe yield of some emerging market countries (sovereign bond for the first three and corporate bond for last one). Spread composite issued by JP Morgan describes the difference between the sovereign bonds yield on emerging market with the bond yield which is considered 'risk free' (T-bill or T-bond issued by the U.S. government or other developed countries).

This study is different from the previous studies because this study specifically examines the behavior of some common indicators of the debt market commonly referred by the actors and the analyst of international market debt at the governmental and private bond markets of Indonesia. However, for certain indicators, in order to sharpen the analysis, this study also conduct comparisons with peer countries, among others in Asia (Philippine and Turkey), Latin America (Brazil) and South Africa. Therefore, by taking into account the possibility of unique conditions of the country then at least the results of this study will be able to describe the condition of Indonesia, although did not necessarily can be applied to other countries, particularly to countries with characteristics similar to Indonesia.

In general, this study focuses on debt market indicators which are often used as a reflection of market appreciation in giving the foreign loans the government and the private sector, particularly in the form of global bond issuance in both the primary and secondary market, namely: the yield sovereign global, yields corporate global bond, composite yields and CDS.

In particular, this paper aims to analyze and formulate strategic measures to keep the movement of Indonesian debt market indicators not too fluctuating and to continue to reflect its fundamental factors. In setting these steps, the author refers, among others, to the identification and measurement of the dominant factors that affect debt market indicators. Keeping the debt market indicators not too fluctuative and reflecting its fundamental factors are very important in order to obtain the cost of funds of foreign loans, that is reasonable and under a measurable risk capacity. An increase in risk that is not under a measurable capacity will push a short rapid capital flow which later can disrupt the stability of Indonesia's financial markets.

The second part of this paper describes the theory and literature studies. The third section reviews the methodology while the results and analysis are described in the fourth chapter. Conclusions and recommendations are to be presented at the end.

II. THEORY

There are various debt market indicators that is often used from the standpoint of the debt market analysts or investors in assessing the risk of a country's and company's foreign loan, particularly in the form of global bond issuance in both primary and secondary markets. Several indicators are commonly used, among others is the yield sovereign global, yield corporate global bond, composite yields, spreads Credit Default Swap (CDS), credit rating, credit worthiness, and financial ratios.

This research is focused on the debt market indicator that is widely used as the benchmarks in pricing of issuance of bonds and loans to the Indonesian government and private sectors in the form of yield, which is the global sovereign bond yield, yield corporate global bond, composite yields and CDS.

In general, the debt market indicators give an illustration of the risks of foreign loans, particularly in the form of global bond issuance in both the primary and secondary markets (portfolio investment). These indicators can well describe the level of the risk of default from different perspectives. Bond yield describes the risk of default by the government/state/ debt issuer corporate, in paying interest and the principal payable within a predetermined time based on the performance of the bond issuer. It can also indicate the risk of failure of issuer to comply with other provisions set forth in the bond contract. While credit default swaps are the most pure form of credit derivatives, which show the risk of the issuer of securities, particularly the stated, based on the total compensation expected to the purchasers of securities on the risks that may be experienced by the publisher. Should a credit event occur, protection buyers will receive a payment from the protection seller. The premiums paid to the protection to the buyer protection seller could be done at once (lump-sum) or periodically.

At a glance, the development of the movement of several Indonesian global bond indicators, represented by the global bond yield of the Indonesian Government and the private sector from 2004 to August 2009 (Figure 2), shows that there have been significant surges in the period of September and October 2008 (almost two-fold). Some similar yet higher surges are also shown by CDS indicators which previously were only at the level of around 500s basis points, which in turn boasted up to around 1000 basis points. A far more severe condition was

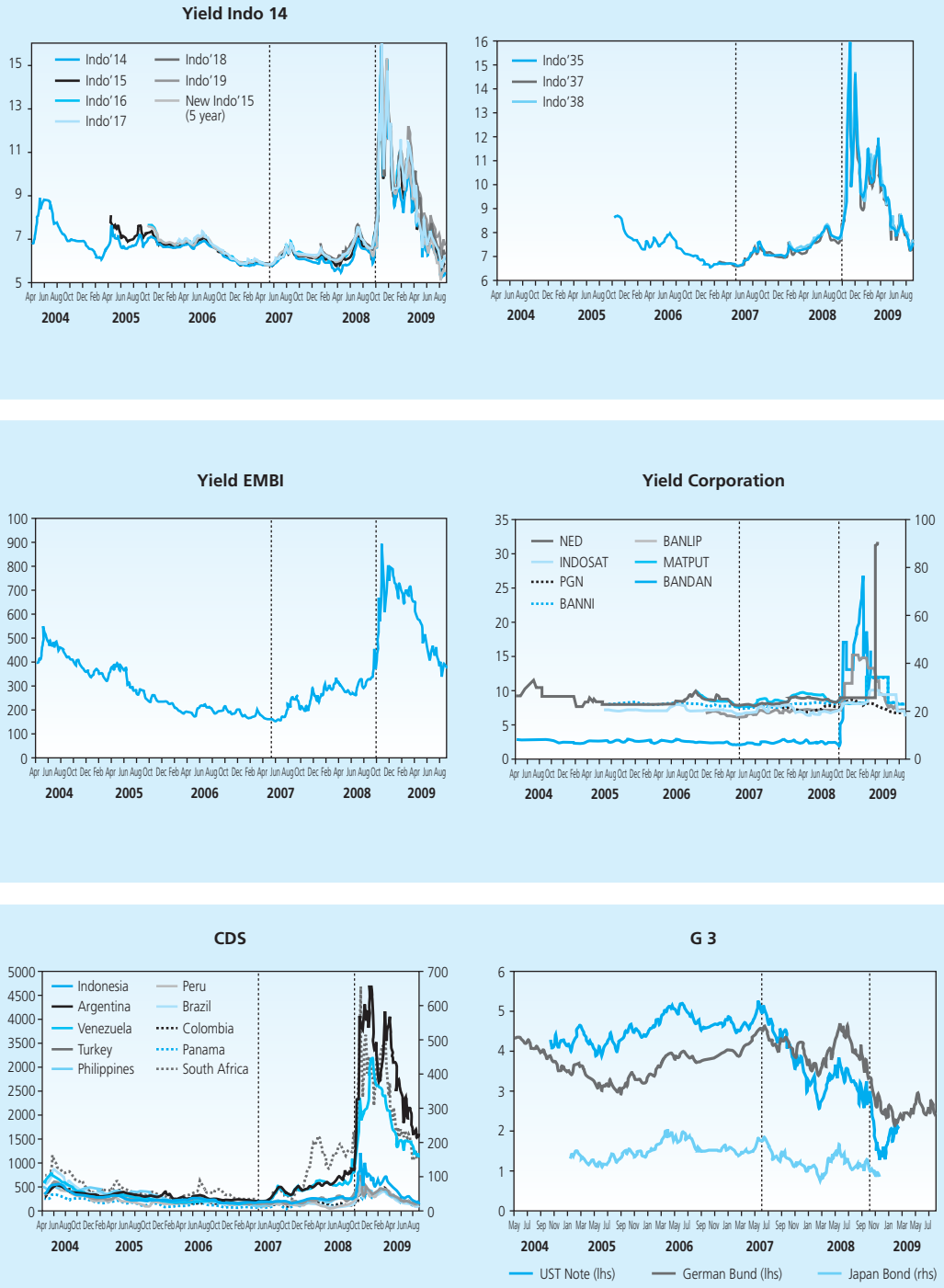


Figure 2.
The development of movement of several PLN indicators

indicated by the peer country, such as Argentina, Venezuela, and Turkey, (which reach above the 4000-basis points). The condition of emerging market yields at that time also experienced an increase about two times higher than the previous value. However, these conditions gradually improved, as indicated by the trend of decline in the numbers of those indicators. Even seemingly in August 2009, they reached the similar level as before the occurrence of these surges. These conditions indicate the existence of performance improvement of market debt indicators of Indonesia and its peers.

If compared with the movement of bond yields of developed countries like the G3 (U.S., Japan and Germany), it does not appear that there are special observations for the period around September and October 2008. It seems that the shocks that occurred in the global debt market, especially in the emerging markets, have lead to the flight to quality so that the global bond yield of the G3 actually declined in that period.

Several previous studies have stated that these indicators are very good in explaining the performance of foreign loans of a country or a company, among which is Min (1998). In his research, Min (1998) stated that for the last few years, many countries promote the development of bond markets and as a result, the corporate bond markets soared as high as the fixed-income securities in domestic and international market, which continuously reduced the dependence on bank financing. But very few know the determinants that influence the yield spreads of bonds issued by developing countries. The changes in this corporate financing pattern are caused by the substantial investment needs in infrastructure and capital improvement projects that require long-term loans with fixed interest rates. This is what encourages Min to conduct a research on the determinants of bond yield spread of some developing countries.

Another case with Alexander & Kaeck (2007) which states that the rapid development of CDS market has raised the importance for financial analysts, traders, and economic policy makers to understand the determinants of CDS. In addition, CDS is more liquid and has different grace period, compared with corporate bonds.

In addition, Karlson & Willebrand (2009) also stated that since the credit crisis, many major banks have failed to pay (default). Therefore it is interesting to find out what factors that affect the credit risk of the financial institutions. CDS spreads is better credit risk indicator. CDS spreads also refers to the CDS index because it shows the credit risk of individual companies than the group of several companies. Because CDS spreads of the major banks have increased, it will be very important to identify the determinants of CDS spreads.

2.1. Sovereign Global Bond

Budina & Mantchev (2000) examined the determinants of the price of Bulgarian Brady bonds using the monthly data from July 1994 until July 1998. This study concluded that in the long run, gross foreign reserves and exports have a positive effect on bond prices. While the real exchange rate and nominal exchange rate depreciation of Mexico has a negative effect.

Meanwhile, Nogués and Grandes (2001) examined the determinants of the spread of Argentina's floating rate bond (FRB) using the monthly data from January 1994 to December 1998. They concluded that the Mexican crisis, debt service to exports, GDP growth, fiscal balance and the 30-year U.S. Treasury yield have a significant effect on the spread.

Min (1998) analyzed the determinants of bond yield spreads in the currency of U.S. Dollar from 11 developing countries in the period of 1991 to 1995. The result is that the differences between one country to another in bond spreads are very much determined by the debt to GDP, reserves to GDP, debt service to export, export and import growth rate, inflation rate, net foreign asset, terms of trade index, and real exchange rate. Min (1998) concluded that the ability to access the foreign markets is largely determined by the domestic fundamental factors within the country. Therefore it is suggested that developing countries which are seeking greater access to international bond markets, to improve their macroeconomic fundamentals.

But Eichengreen & Mody (1998) underlined the importance of external factors, other than fundamental factors, in the analysis of market sentiment. By analyzing almost 1000 data of developed country bonds issued between 1991 up to 1996, they found that bond yield spreads largely depend on issue size, credit rating issuer, debt to GDP, and debt service to export ratio. The main conclusion of this study is that changes in market sentiment do not depend only on the fundamentals, but also on market or external factors.

Goldman Sachs (Ades et. al. (2000)) even modeled the spread sovereign of developing countries by adding the default history factor, apart from several fundamental factors. By analyzing the monthly data of 15 developing countries from January 1996 to May 2000, they obtained some variables which have a significant effect on the spread, such as GDP growth rate, total external amortizations as a ratio of foreign reserves, external debt to GDP ratio, fiscal balance, export to GDP ratio, real exchange rate misalignment, international interest rates, and default history of the country.

Furthermore, Rowland and Torres (2004), by using panel data techniques, checked the determinant of the spread from 16 developing countries which issued sovereign bond. By using the annual data from 1998 to 2002, they found that the GDP growth rate, external debt

to GDP ratio, external debt service to GDP ratio, debt to exports ratio, reserve to GDP ratio, and export to GDP ratio have a significant influence on the spread.

Then Rowland (2004) continued the previous research by conducting an analysis in 29 developing countries from 1998 until the end of July 2003. The result concluded that only the GDP growth rate and inflation rate that have a significant effect on the spread.

Claudia Berbecaru-Floriana (2008), one of the main references in this study, in addition to evaluating the determinants of sovereign bonds issued by developing countries in Europe, has also conducted research to find out how important the contribution of external factors in the development of spread from the sovereign bond of Romania. The results of this study indicated that not only the fundamental factors that influence the development of Romanian bond spreads but also the external factors such as the risk appetite of international investors. This research by Berbecaru Claudia-Floriana confirmed the previous research by Eichengreen and Mody (1998).

Based on historical data, in 2007 there was a decline in the spreads of Romanian EMBIG and composite EMBIG, accompanied with the increase in fundamental domestic real (such as the declining inflation, the increased GDP growth, the reduced external imbalances) in many developing countries. According to Claudia Berbecaru-Floriana, this was not only due to the fundamental domestic factors but also by the external factors. It was indicated that in 2002 the risk appetite of investors in the international market was also increasing rapidly. This is why Claudia-Floriana Berbecaru used the fundamentals and external factors in her empirical test.

As one of the most important determinants of EMBIG spreads, according to the study, the fundamental factors are assessed by the exchange rate regime, inflation, GDP, current account, external debt, national savings, foreign exchange reserves, fiscal policy, etc. In that context, the sovereign ratings was used to every country in the long term, issued by the international rating agencies (S&P) as an aggregate indicator which showed the fundamental development of each country.

2.2. Corporate Global *Bond*

Research on the determinants of global corporate bond is not as much as the global sovereign bond. One of them is Douglas, Huang & Vetzal (2009). They found in their research that cash flow volatility is economically significant to the yield spread. Yasmine Meitasari & Amelia (2007) conducted research on macroeconomic factors and financial ratios to return in domestic corporate bonds in the year 2003-2005. The result was that deposit rates, asset

turnover, quick ratio, debt to equity ratio, and return on assets do not affect significantly the domestic corporate bond return.

One of the objectives and the advantages of the ratio is can be used to compare the relationship of the company's returns and risks at different sizes. The ratio also can indicate a company profile, economic characteristics, competition strategy and uniqueness of characteristics, finances and investments (IG. KA Ulupui, 2006). According to James C. Van Home (Sawir, 2001), analysis and interpretation of various ratios can give a better view of the company's financial condition and performance than analysis based solely on financial data alone which is not under a form of a ratio. In addition, according to White et al (2002), financial ratios are used to compare the risk and the yield rate of various companies to help investors and creditors, to take good investment and credit decisions.

Meanwhile, White et.al. (2002) grouped financial ratios into 4 parts: analysis of the company's liquidity, solvency analysis and Long Term Debt (Leverage), profitability analysis of company and activity analysis.

1) Analysis of the Corporate Liquidity

   In general, the first concern of many financial analysts is the liquidity. This analysis measures the adequacy of the company's cash resources to meet the liabilities associated with the short-term cash. The commonly used liquidity ratios are the current ratio. Current ratio is the most common measure used to determine ability to meet the short-term liabilities as this ratio indicates how far the demands of short-term creditors met by the assets expected into cash during the same period of the maturity of debt.

Current Ratio = Current Assets/Current Liabilities

2) Solvency Analysis and Long Term Debt (Leverage)

   This analysis examines the financial structure and capital of the company. Financial structure is the way the company finances its assets. The company assets funded with short-term debt, long-term debt and equity of shareholders, the way that the entire right side of the balance sheet shows the financial structure.

   Capital structure is a permanent funding composed of long-term debt, preferred stock, and shareholders equity. The book value of shareholders' capital consists of common stock, paid-up or surplus capital, accumulated retained earnings. With the equation:

Financial Structure – Current Debt = Capital Structure

The selection of financial structure is a matter which concerns the composition of funding that will be used by the company, which in turn determines how much debt (financial leverage) which will be used by the company to finance its assets.

If all the funds to finance the company's assets come from the owner in the form of a common stock, the company is not bound by fixed obligations to pay interest on loans taken in the context of corporate financing. An interest is a fixed financial cost to be paid and added to the fixed operational costs regardless the level of corporate profits. So, a company that uses debt would be more risky than those without one, because in addition to having a business risk, a company that uses debt has a financial risk. This financial risk arose from the use of debt, which leads to greater variability in net income.

Financial leverage is the use of debt. If the result of return on assets, which is indicated by the amount of economic profitability, is greater than the cost of debt, the leverage is then profitable and the outcome of the return on capital (the own capital profitability) with the use of leverage will also increase.

Any policies regarding the capital structure involve a tradeoff between the risk and return. There are several factors that influence the decisions related to capital structure. First is the corporate business risk, or the risk level contained in the company's assets if it does not use debt. The bigger the risk of the company, the lower will be the risk of the optimal debt. The second key factor is the company's tax position. The main reason of using a debt is that the interest costs can be deducted in the calculation of taxes, thus minimizing the actual cost of debt. The third factor is the financial flexibility, or the ability to raise capital with a reasonable requirement under a disadvantaged condition.

One of the most commonly used leverage ratios, among others, is the ratio of debt to equity ratio (DER). This ratio describes the ratio of debt and equity in the funding of company and shows the ability of the company's equity capital to meet all its obligations.

DER = Total Debt / Total Equity

3) Corporate Profitability Analysis

Profitability ratio will provide the final answer on the effectiveness of corporate management. This ratio gives an idea of an effectiveness of management of the company. One of the commonly used profitability ratio is the Net Profit Margin or Profit Margin on Sales. This ratio measures the net profit after tax to sales.

Net Profit Margin = Earnings after Taxes (Net Income) / Sales

4) Activity Analysis

This analysis evaluates the revenue and output generated by the assets of the company.

Eduardo Cavallo & Patricio Valenzuela (2007) examines the determinants of corporate bond spreads from developing countries including Indonesia in 1999 to 2006. The results showed that the corporate bond spreads are determined by company-specific variables, bond characteristics, macroeconomic conditions, sovereign risk, and global factors. The company-specific variables used included EBIT/Assets, Equity/Capital, Debt/Asset, Size, and volatility equity. Meanwhile, the macroeconomic conditions were represented by the growth of GDP and GDP per capita.

2.3. *Credit Default Swap* (CDS)

Credit derivative, one of the structured securitization credit products, has been specifically accused of contributing to the global crisis (Longstaff and Myers 2009)[3]. Among the derivative products, the most popular and very much in demand by the investors, is the credit default swaps (CDS). Therefore, it is common for the market to read the movement of CDS as an indicator that describes the country default risk.

Alexander & Kaeck (2007) conducted a research on the determinants of CDS spreads since June 2004 to June 2007. The result was that interest rates, stock returns and implied volatility have a significant effect on CDS spreads.

Keng-Yu Ho & Yu-Jen Hsio (2004) used the Merton model and tested it empirically using data from 2001 to 2004 to analyze the determinants of CDS spreads. The results showed that leverage and implied volatility have positive effect, while risk free rate negatively affects the CDS spreads.

Next Karlson & Willebrand (2009) conducted a research on the determinants of CDS spreads from the European financial institution. The goal of this study was to test how well the theoretical determinants can explain the CDS spread and whether there are other factors that influence it. The theoretical determinants of Merton model are leverage, volatility, and risk free rate. The data used are the weekly data of CDS spreads of 30 financial institutions from December 2005 until November 2008. By doing a linear estimation of panel data using the theoretical determinant variables and other additional variables, they found that the changes in historical volatility, risk free rate, equity return, implied volatility, square of risk free rate, the slope of the yield, bid-ask spread, and lagged CDS spreads are statistically significant in explaining the relation to changes in CDS spreads.

3 Longstaff F.A and Myers B., 2009. Valuing toxic Assets: An Analysis of CDO equity, National Bureau of Economic Research.

Just like in bond spreads, CDS has become one of the key indicators of credit quality of corporations, banks and government. Normally it is the Credit Default Swaps market that determines the bond market so that most price discovery occurs in the CDS market[4]. Empirical study by the Deutsche Bundesbank[5] informs that CDS spreads and bond spreads contribute to the price discovery in the European credit markets[6]. CDS market is more dominating in normal times, but in times of crisis the price discovery is more determined by the bond spread. Both experience fluctuations in the times of crisis.

2.4. *Credit Rating*

Credit rating is an indicator of the payment on time of principal bond debt and its interest. In addition, credit rating reflects the scale of the risk of traded bond. Thereby credit rating indicates the scale of bond security to pay principal obligation and its interest in a timely manner. The higher the rating, the more it shows that it is capable to avoid the risk of bond default. As explained above, some researchers, such as Berbecaru Claudia-Floriana (2008), consider the credit rating, issued by independent rating agencies, as an interpretation of the fundamental conditions of a country.

In the study of Berbecaru Claudia-Floriana (2008), research is conducted, aiming to determine the relationship between the Romanian EMBIG spreads and some other developing countries with the fundamental factor, which is represented by a credit rating, as well as the risk appetite factor of international investors, which is represented by the VIX volatility index. The result is that there is a long-term relationship between the EMBIG spread, credit rating and the VIX index.

In Indonesia there are two rating agencies, namely PEFINDO (*Pemeringkat Efek Indonesia*) and Kasnic Credit Rating Indonesia. While in the international scope there are plenty of rating agencies, among which are Moody's, S&P, and Fitch. These rating agencies help the investors by providing investment information on economic and financial capabilities of the bond publisher (issuer). Bond rating issued by rating agencies gives information of the credibility (credit worthiness) and affects the bond sale (Fabozzi, 2000). Outstanding credit rating usually changes when significant changes occur in its determinant factors, such as improvement of economic, social and political conditions which is supported by better and various government policy

4 Blanco, R., S. Brennan, and I.W. Marsh, 2003 "An Empirical Analysis of the Dynamic Relationship between Investment Grade Bonds and Credit Default Swaps" Working Paper, Bank of England.

5 Niko D□tz, 2007. Time-varying Contributions by the Corporate Bond and CDS Markets to Credit Risk Price Discovery, Deutsche Bundesbank, Discussion Paper, Series 2: Banking and Financial Studies.

6 The study is based on companies listed in the iTraxx CDS index.

package, or vice versa, the worsening economy of a country. But the rating condition may also be influenced by global factors. Changes in credit rating are not as fast as changes in bond yield or CDS.

III. METHODOLOGY

3.1. Empirical Model Specification

Referring to the previous studies, the following model specification is used in this study to determine the factors affecting each indicator:

1) Indicators of Global Sovereign Bond Yield

Global sovereign bond yields are grouped into two: the individual global sovereign bond yield and composite global sovereign bond yield. Individual global sovereign bond is a global or foreign government bond issued by a state. The Government Bonds INDO14 is chosen as the representative of the bonds issued by the Indonesian government because of the availability of the data that is long enough. While the composite global sovereign bonds are the composite of global bonds or foreign emerging market bond index (EMBI), produced by JP. Morgan.

The selection of the model below, is in accordance with the previous studies that included several macroeconomic variables that determine the movement of bond yield spreads, as the study of Budina & Mantchev (2000), Nogués and Grandes (2001), Min (1998), Goldman Sachs (Ades et . al. (2000), Rowland and Torres (2004) and Rowland (2004). However, the development model is conducted in accordance with the study of Eichengreen & Mody (1998) which concluded that not only the fundamentals that determine the market view but also the external factors. Therefore, the news variables are added in the form of dummy as a factor that influence the movement of global sovereign bond yield in Indonesia and its peer countries, and the composite yield.

In general, the employed empirical models are divided into two, namely the global bond yield determinants model and the vector of determinant variables derived from domestic and external. Based on the model developed by Claudia Berbecaru-Floriana (2008), the author test whether external factors also affect the individual global sovereign bond in Indonesia, with the following empirical model:

$$\textbf{Indo 14} = f(\textbf{GDP, FB/GDP, INF, FR, VIX, Fut. RATE, Volat. rate}) \quad (1)$$

With the wider use of the data, the variants of this model are also used to analyze the determinants of the global sovereign bond yield from some countries, Indonesia and its peers. Specifications of the variant of this model are:

$$\textbf{Yield} = f(\textbf{GDP, FB/GDP , INF, FR, TEXTD/FR, D1, VIX}) \quad (2)$$

For the composite yield, an empirical model is applied to the data of Indonesia and its peers as follows:

$$\textbf{EMBI} = f(\textbf{GDP, FB/GDP, REER, DSR, D1}) \quad (3)$$

2) Indicators of Global Corporate Bond Yield

As the global sovereign bond yields, the global corporate bond yields are grouped into two categories, namely the individual global corporate bond yield and the composite global corporate bond yield. The individual global corporate bond is a global or foreign bond issued by a company. While the composite global corporate bond (CEMBI) is a composite of global or foreign bonds that is issued by some corporations in some developing countries.

The established model in this study is consistent with those in the research of Eduardo Cavallo & Patricio Valenzuela (2007) by combining the micro and macro factors as the determinant of the movement of corporate bond spreads. Another study which backs up this study is by Douglas, Huang & Vetzal (2009), Yasmine M Eduardo Cavallo & Patricio Valenzuela (2007), Itasari & Amelia (2007) which also included the financial ratio of the company (micro elements), in addition to the macro factors. According to IG. K. A. Ulupui (2006) and James C. Van Home (Sawir, 2001), the ratio can also indicate the company profile, economic characteristics, competitive strategy and the unique characteristics, financial and investment analysis. White et.al. (2002) also emphasized on important factors of financial ratio to compare the risk and the yield rate of the various companies to help investors and creditors in making the investment and good credit decisions. The specification of the equation is:

$$\textbf{Yield corporate global bond} = f(\textbf{CR, DER, NPM, ROE, INF}) \quad (4)$$

3) Indicators of Credit Default Swap (CDS) Yield

This study developed the model of Karlson & Willebrand (2009) which is the development of the Merton model. Merton used the variable leverage, volatility, and risk free rate to explain the movement of CDS spreads, while Karlson & Willebrand added the variables of historical volatility, risk free rate, equity return, implied volatility, square of risk free rate, the slope of the

yield, bid-ask spread, and lagged CDS spreads which are statistically significant in explaining the relation to changes in CDS spreads.

Other research also suggests that CDS variable to be the reference in the study are Alexander & Kaeck (2007), and Keng-Yu Ho & Yu-Jen Hsio (2004) who used Merton model and stated that leverage and implied volatility have positive effect, while the risk free rate gives a negative effect on CDS spreads. The empirical model is as follows:

$$\textbf{Yield CDS} = f(\textbf{UST, VSTOXX, CDS Bid ask, CDS}_{-1}\textbf{, GDP}) \quad (5)$$

3.2. Estimation Technique and Data

Technical estimation of panel data regression estimates is used to model the peer's'sovereign'yield, composite yield and peer's CDS'yield. To estimate the regression model with the panel data, 3 approaches can be followed: OLS (common effect), dummy variable (fixed effect), and random effects.

The data used in this study is particularly the data of Indonesia (INDO). However, to sharpen the analysis, a comparison with some peer states (in this case has a credit rating in the same range) is conducted, such as Brazil (BRA), Colombia (COL), Panama (PAN), Peru (PERU), Philippines (Phil), Turkey (Turk), and South Africa (SA). For the indicators of global corporate bonds, the sample used was 10 corporations consisting of 6 companies and 4 banks, where the corporations are the corporations that published the global bond or foreign bond: PT. Indosat Tbk (Indosat), Medco Energy International (MEDCO), PT. Excelcomindo Tbk (EXCEL), PT. Matahari Putra Prima (MATPUT), Sanyo Electronics Indonesia (SANYO), the National Gas Company (PGN), Bank Negara Indonesia (BNI), Bank Danamon (BANDAN), Bank Niaga (Banni), Lippo Bank (BANLIP). For the panel data model, annual data is used. As for the model of time series data, monthly data is used. The data sources used is from by Bloomberg, Moody's, IFS, and Bank Indonesia.

IV. RESULT AND ANALYSIS

4.1. The Individual Sovereign Global Bond Yield

Using Indonesian data, the estimation on the influence of fundamental and external factors to the Indonesian government's sovereign bond yield (INDO14) is given below. This empirical model is based on Berbecaru Claudia & Floriana (2008):

$$INDO14_t = \underset{(4'922749)}{2\ 627905} + \underset{(1'165693)}{0\ 114580}\ GDP_t + \underset{(2'717603)}{1\ 704245}\ FB\_GDP_t + \underset{(2'619554)}{0\ 445840}\ D_t - \underset{(4'709877)}{1\ 130914}\ INF_t -$$

$$\underset{(0.262587)}{0\ 736703}\ FR_t^{*} + \underset{(0.047631)}{0\ 270265}\ VIX_t^{*} - \underset{(0.609840)}{0\ 280411}\ FUT\_RATE_t - \underset{(7.754395)}{3\ 603485}\ VOL\_RATE_t$$

$R^2 = 0.555854,$ *) $Sig.\ \alpha = 10\%$

This estimation result indicates that the fundamental factor that affects most significantly the global sovereign bond yield of Indonesia is the foreign reserves (FR) while the external factor is the VIX index.

The role of foreign reserves is very significant in determining the amount of insurance required by investors when purchasing securities of a country. An empirical test shows that an increase of foreign reserves by 1% would cause a decline of global sovereign bond yields by 0.737%. Meanwhile, the VIX index, as one of the primary measurement of market expectations of short-term volatility (30 days), and which is usually taken into consideration by many to be a barometer of investor sentiment and global market volatility, also affect very significantly the amount of compensation required by investors when Indonesia holds the debt. As noted earlier, the VIX tends to fall when market sentiment improved. Therefore, the VIX can be considered as a proxy for investors to avoid risk and to be able to explain the movement of the emerging market bond spreads (K. Hartelius, K. Kashiwase, and LE Kodres 2008). However, based on this research, the influence of foreign reserves is greater than the influence of VIX index.

For the data that covers Indonesia and its peers, the estimation of empirical model is conducted by using the common effect panel data estimation techniques, which the result is given as follows:

$$YIELD_{it} = \underset{(17.37858)}{-31.03194} + \underset{(3.148757)}{1.247196}.GDP_{it} + \underset{(2.313377)}{1.303275}.FB\_GDP_{it} + \underset{(2.4284)}{7.425715}.D1_{it}^{*} - \underset{(0.669138)}{0.659693}.INF_{it} -$$

$$\underset{(0.038218)}{0.096408}.FR_{it}^{**} + \underset{(1.226606)}{0.181007}.TEXTD\_FR_{it} + \underset{(0.242820)}{0.675921}.VIX_{it}^{**}$$

$R^2 = 0.556758,$ *) $Sig.\ \alpha = 1\%,$ **) $Sig.\ \alpha = 5\%$

This model shows that global sovereign bond yield is significantly affected by foreign reserves (FR) the VIX index, and the dummy issue (D1). Based on empirical test results above, the percentage change in foreign reserves is adversely affecting the global sovereign bond yield, which means that an increase in the reserves would reduce the global sovereign bond yield of these countries. It is also in accordance with studies conducted by Budina & Mantchev (2000), stating that foreign reserves are considered to be the first important factor when

discussing the chances of a crisis. Therefore the lower a country's foreign reserves, the lower the country risk rating, meaning that the greater the chance of a default occurring.

The VIX Index has positive influence on global sovereign bond yield, where each 1% increase of the VIX index will encourage an increased yield by 0.75%. The significance of the VIX index is in line with the statement Hartelius K., K. Kashiwase, L.E. Kodres (2008) that the VIX index can be considered as a proxy for investors to avoid risk. Global sovereign bond yield reflects the default risk of a country and the level of investors' unwillingness to purchase the bonds that country. So the risk appetite of investors'is determined by the investor's financial condition, liquidity risk in the debt market, which greatly affects the global sovereign bond yield movements.

What is interesting from this result is that dummy issue variable significantly affecting yield, meaning that issues, especially negative news, will significantly improve yield. Therefore, it does not seem appropriate if the policymakers underestimate the various rumors circulating in the market, especially they are the negative ones. To respond to this, the stakeholders need to treat a variety of issues that developed in the market and seek a variety of efforts to minimize the negative issues about Indonesia in the international market. Some ways that can be achieved, among others, is by providing an explanation, directing and consistently maintaining the credibility of information delivered.

4.2. Composite Sovereign Global Bond Yield

And to see the relationship between the composite global sovereign bond yields with the fundamental factors of some countries, including Indonesia, by using panel data estimation, then based on model selection test, model which will be analyzed is the model using a common method effect. The estimation results are as follows:

$$EMBI_{it} = \underset{(5.0236)}{2.6163} + \underset{(0.5841)}{0.1249}.GDP_{it} + \underset{(0.4711)}{0.2226}\,FB\_GDP_{it} - \underset{(1.174)}{1.3364}.D1_{it} - \underset{(0.0916)}{0.2003}.REER_{it}^{**} + \underset{(0.0721)}{0.2890}.DSR_{it}^{*}$$

$$R^2 = 0.4188, \qquad *)\ Sig.\ \alpha = 1\%, \qquad **)\ Sig.\ \alpha = 5\%$$

The estimation results show that, for the data of Indonesia and its peers, the variables that affect the composite yield of this region are only real effective exchange rate (REER) and the risk of default (DSR), while the fundamental variables like GDP and market issues, do not actually cause a significant influence.

REER or real effective exchange rate is the weighted exchange rate of a currency against a currency basket, which has been adjusted to the inflation in a given year. Generally, the scaling of the exchange rate of each currency uses the value of trade of these countries. REER is therefore more appropriate to be used as an index to measure a country's export competitiveness. Based on the estimation model, an appreciation of REER by 1% will cause a decrease in composite yield index by 0.2%.

Besides REER, DSR variable also significantly affects the composite global sovereign bond yield in a positive way. This ratio indicates the amount of income needed in a year to pay the total annual debt, so that the greater the DSR, the greater the risk of default. The estimation results indicate that an increase of default risk due to a 1% increase of DSR will encourage an increase of composite EMBI yield by 0289%.

4.3. Corporate global bond yield

In analyzing the case of global corporate bond yield, based on the journal of Eduardo Cavallo & Patricio Valenzuela (2007) and by using the panel data estimation and test of model selection, estimation results are obtained by using the common method effect as follows:

$$Yield\_Corp_{it} = \underset{(0.7748)}{0.38688} + \underset{(0.003189)}{0.0142}.CR_{it}^{*} - \underset{(0.001782)}{0.00244}.DER_{it} + \underset{(0.01749)}{0.1519}.NPM_{it}^{*} - \underset{(0.016617)}{0.03664}.ROE_{it}^{**} + \underset{(0.10361)}{0.7029}.INF_{it}^{*}$$

$R^2 = 0.6588,$ *) $Sig.\ \alpha = 1\%,$ **) $Sig.\ \alpha = 5\%$

From the estimation results, it can be seen that almost all variables except the debt equity ratio (DER) significantly affect the yield of individual global corporate bond for the corporations in Indonesia.

Return on Equity (ROE) significantly affects the yield of Indonesian corporate. This ratio indicates the ability of own capital to generate profit. So when a company's ROE increases, the yield of an Indonesian corporate will decline. Empirically for the corporate bond market in Indonesia, an increase by 1% of ROE will reduce corporate bond yield by 0.03%.

Empirical model specification above only includes a single macro variable which is inflation. This is because inflation is a price indicator that will affect production and profits of the corporation. Based on the above estimation, inflation greatly affects corporate yield in Indonesia. It can be seen from the grand value of inflation coefficient. With 1% of inflation the yield of corporate Indonesia will increase by 0.702982%.

On the other hand, the empirical estimation results above show the anomaly where the effect of the current ratio (CR) and net profit margin (NPM) give a positive influence on the yield of corporate bonds, and this is contradictive to the theory. The current ratio shows the ratio of current assets to the company's debt, where a larger CR magnitude shows a better condition of the company's fundamentals. The consequence is that the bonds yield issued by these healthy companies, does not have to be large or tend to be lower than the company with weaker fundamentals. This means that the CR should negatively affect the yield. The same logic applies to corporate profits (NPM).

Based on the research of Ulupui (2006), the allegations of this anomaly took place post-economic crisis when the investors began to pay attention to cash management, accounts receivable, and inventories of the company before deciding to invest. Thus, although many current assets exceed current liabilities, or though the levels of profit is improving, the conditions still remain a concerns for investors related to the company's ability to manage cash and accounts receivable.

Basically, the current ratio shows the margin of safety or the company's ability to repay these debts. But a company with a high current ratio does not necessarily guarantee that it will be able to repay the debts that have already passed the due date, because there is a possibility that the amount of supplies is one of the causes of the mounting assets. The proportion or distribution of non-profitable assets, because of this amount of inventory that is relatively high compared to the estimated level of sales to come, caused low inventory turnover and showed the existence of over-investment in the inventory. Plus the outstanding amounts account receivable that is proven to difficult to recover. Therefore, the lower a company's ability to generate revenue for the company will increase the risk of the company to be defaulted. Therefore, the yield is still increasing.

In addition, although in general a low current ratio contains more risk than a high current ratio, sometimes a low current ratio shows the leads of the company are capable in using the current assets very effectively. That is when the balance is adjusted with only the minimum requirement of inventory and the receivables cycle from the inventory is increased to the maximum level. Total cash required depends on the size of the company and especially of the amount of money necessary to pay the debt, the costs of routine and emergency expenses (Single, 1995: 157).

In the case of NPM, NPM in general is one of the profitability ratios which will provide the final answer about the effectiveness of corporate management. This ratio gives an idea on how effective management of the company. The greater the NPM ratio, the bigger the net profit in a way that it is possible to assess how effective the better management of the company.

This will reduce even more the default risk. But if the large net profit is mostly used to pay taxes or other charges whose amount is larger than the debt payments, the impact on default risk will tend to grow up.

4.4. CDS Yield

Based on the model used in the research Alexander & Kaeck (2007) to analyze the relationship between CDS yield in Indonesia with its determining factor, the estimation result using OLS method is as follows:

$$\Delta Yield\_CDS_t = \underset{(0.1579)}{-0.1833} + \underset{(0.51350)}{0.6733}\,\Delta US\_T_t + \underset{(0.01234)}{0.1383}.\Delta VStoxx_t^{*} + \underset{(0.00539)}{0.00084}.\Delta CDS\_Bid\_Ask_t^{*} +$$

$$\underset{(0.15222)}{0.89194}.\Delta Yield\_CDS_{t-1}^{*} - \underset{(0.02139)}{0.041132}.\Delta GDP_t^{***}$$

$R^2 = 0.913489$

*) $Sig.\ \alpha = 1\%$, **) $Sig.\ \alpha = 5\%$, ***) $Sig.\ \alpha = 10\%$

Based on estimation above, there are three variables that significantly affect the CDS yield Indonesia. First, the implied volatility that reflects market views toward Indonesia, as reflected by the changes of VStoxx index. A 1% increase in the index would increase the probability of default occurring (yield) of 0.138352%. Besides yield CDS also positively influenced by CDS yield, which previously was valued around 0.891946%.

In addition to external factors, there is a macroeconomic fundamental factor which affects negatively yield of Indonesian CDS: real GDP growth. This shows that the level of country risk, especially Indonesia, is strongly influenced by the economic growth of Indonesia, which is reflected by the real GDP of Indonesia. This is consistent with the theory that stated that the better the economic conditions of a country, the smaller will be the country's default risk perceived by the investors. But among the three variables that significantly affect the movement of yield CDS Indonesia, the one with the greatest influence is the yield previous CDS. Therefore, a constant effort to keep the movement of CDS on the level considered safe becomes very important.

To analyze the relationship between yield CDS of Indonesia and its peers with their determining factor, the same model as before is used, with a slight different method of estimation of panel data. So based on the selection test model, the one to be analyzed are fixed effect model using the method:

$$\Delta Yield\_CDS_{it} = \underset{(0.311896)}{-0.8925} + \underset{(0.57119)}{0.5261}.\Delta US\_T_{it} + \underset{(0.063044)}{0.2182}.\Delta VStoxx_{it}^{*} + \underset{(0.003538)}{0.00084}.\Delta R\_FISE_{it}^{*}$$

$$\underset{(0.002589)}{-0.00062}.\Delta CDS\_Bid\_Ask_{it} - \underset{(0.08012)}{0.13416}.\Delta Yield\_CDS_{i,t-1}^{*} + \underset{(0.185085)}{0.2281}.\Delta GDP_{it}$$

$R^2 = 0.399709, \qquad *)\ Sig.\ \alpha = 1\%,$

with the fixed effect (cross) each country as the follows:

_PHIL--C	-0.644844
_INDO--C	0.138755
_BRA--C	-1.266955
_COL--C	2.481957
_PERU--C	-0.680520
_TURK--C	0.225518
_PAN--C	-0.553362
_SA--C	0.299449

Similar with the CDS yield in Indonesia, any VStoxx index change that reflects the risk level of a country risk is also applicable to the peers. Increased volatility will increase the probability of default. And when the probability of default increases, the cost of default insurance as described by the CDS yield will increase as well. Therefore the CDS yield will increase when volatility increases. So it can be concluded that the CDS yield is determined by the volatility index, proxied by VStoxx.

V. CONCLUSION

This study analyzes the debt market in Indonesia with a focus on 2 indicators, namely bond yield (individual or composite) and CDS (Credit Default Swap) yield. This study rises some conclusions, *first*, the empirically, this research shows that in the debt market in Indonesia, inflation level, foreign reserves (which reflects the conditions of liquidity) and the VIX index (which reflects the level of market sentiment), affect the movement of global government bond yield in Indonesia. This conclusion is consistent with individual debt market conditions of any peer countries of Indonesia. For the composite yield on government bonds (composite global sovereign bond), the influential factor is the real effective exchange rate or REER and the debt service ratio (DSR). *Second*, the movement of yield for corporate bonds is affected by the company's fundamentals, such as current ratio, net profit margin, and return on equity and

also by inflation. Meanwhile indicators of CDS yield in Indonesia yield are greatly affected by VSTOXX index, yield on the previous CDS and GDP growth

The study provides several implications. For monetary authorities, there are at least 2 things. First is to keep in mind that inflation significantly affects the movement of global government bond yield in Indonesia. Therefore, Bank Indonesia, as the authority in charge in keeping the inflation rate, needs to have a strong commitment to continuously improve the transparency and the speed of information on monetary policy taken in accordance with international best practices in the inflation targeting framework. One also needs to optimize the use of media and the market access expansion in delivering the information and data related to monetary policy. Second, Bank Indonesia needs to continue to make efforts in securing the foreign exchange liquidity supply lines in order not to cause any pressure on the exchange rate and so that the exchange rate really reflects its fundamental factors, either in the form of supply demand of the foreign exchange for import-export activities, FDI, foreign loans or portfolio investment.

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